Gulf of Maine Research Institute
Science. Education. Community.

DKa Dangermond Keane Architecture

Gloucester I4-C2

Marine Innovation Center

Concept Study

October 2014

Contents

Executive Summary

This report describes a conceptual design effort commissioned by the City of Gloucester to engage potential tenants and community stakeholders in the conceptual design of a multi-tenant marine innovation center to occupy city-owned property at 65 Rogers St., also known as the I4C2 parcel. The Gulf of Maine Research Institute (GMRI), headquartered in Portland, ME, was retained to lead this process. GMRI engaged Dangermond Keane Architects of Portland, OR to provide conceptual design services, and Fisher Communications in North Andover, MA to coordinate communications among potential tenants, the City and the project team.

The process involved a series of three full-day workshops over an eight-month period commencing in October, 2013. In Workshop 1, twenty people attended, including potential tenants and Gloucester citizens representing community interests. Key conclusions centered on the importance of a focus on the future of the fishing industry, Gloucester's unique maritime history and location, and the advantages and challenges of the I4C2 site. Tensions between tourism and the working waterfront were noted, as well as the challenges of collaboration across the fishery, product development, academic and regulatory sectors. A vision was advanced that the proposed Center, by enabling co-location, would encourage beneficial interactions that are presently unlikely to happen. At this first workshop, the concept of integrating Ocean Engineering, Ocean Product Development, and Adaptive Fisheries Management & Research began to emerge. A fourth overarching focus on Public Education about Gloucester's fishing and maritime future was also articulated by public participants.

After Workshop 1, the design team, working with Gloucester planning and community development officials, responded to the public outcomes described above, proposing that the remaining workshops explore an integrated concept with potential tenants in the above-described fields. With this narrowed focus, the design team recruited potential tenants representing these four business, academic, educational and regulatory interests. In Workshop 2, thirty-three participants attended, including fifteen potential tenants and eighteen citizens representing local businesses and organizations. Potential tenants provided explicit feedback about their needs, interests and concerns, and local citizens discussed the proposed multi-tenant center in the context of broader community interests.

Between Workshops #2 and #3, the design team integrated the needs of the potential tenants with the site conditions and zoning regulations to produce a conceptual building design and layout on the I4C2 site. This conceptual design provided a narrowed plan for discussion at Workshop 3, which welcomed thirty-three participants, including seven potential tenants and twenty-six Gloucester citizens representing a broad array of waterfront businesses, organizations and local regulatory bodies. This workshop was divided into four topical sub-sessions, including Ocean Engineering, Ocean Product Development, Adaptive Fisheries Research and Management, and Public Review and Input.

Domain-specific discussions further amplified tenant needs, while public discussion emphasized the type of resources or institution required to set up and operate the proposed multi-tenant facility. This question, about the specifics of who will develop, own and run this multi-tenant facility will be resolved by City of Gloucester leadership in the months ahead. Aspects of the public discussions at each workshop were pointed, as Gloucester citizens care deeply about the future of their waterfront, and are already engaged in numerous initiatives that may or may not align closely with the outcomes of this study. There are widely-varying points of view about the likely future of the fishing industry, and deep tensions around the role that NOAA plays in promulgating fishery policies. Citizens also raised numerous questions about a proposed capital and operating cost model, as well as a financing strategy. The design team observed that these projections would be part of the final report.

The concept design process involved a thorough site review to better understand both the advantages and the constraints that the I4C2 site offers to the proposed development. Advantages include direct harbor access, vessel wharfage, proximity to the central business district and further development of a presently-underutilized city property. Constraints include usage restrictions based on Designated Port Area (DPA) classification, revised FEMA Base Flood Elevation maps (BFE) and zoning requirements that limit building height and require extensive onsite parking.

Having identified the areas of focus for the proposed multi-use center, the design team and the city solicited the participation of potential tenants working in the fields of Ocean Engineering, Ocean Product Development and Adaptive Fisheries Research and Management. During the second and third workshops, seventeen potential tenants provided substantive input about their requirements for participation in such a facility. These potential tenants represent the fresh seafood industry in Gloucester, local fishery organizations, ocean engineering firms, academic institutions involved in both marine science research and marine policy, and state and federal fishery management agencies. The concept design that resulted includes both specific needs for this range of institutions, like wharfage, equipment storage, laboratory suites, workshops, test kitchens and office suites, to space that could be shared among all tenants, including large and small conference rooms, a break room/kitchen and library, a modest visitor center and a loading dock.

The design concept that resulted from this process includes two connected wings, an office/test kitchen and lobby wing that fronts on Rogers Street, and a perpendicular laboratory wing that provides research functionality and access to the wharf. Proposed size of the combined structures is 57,750 gross square feet (gsf), and public access from Rogers Street to the HarborWalk is amplified.

The capital cost estimate indicates soft cost and construction costs of $28.9 million in 2017 dollars. The development team recommends that these costs be supported by roughly equivalent contributions from social impact investment, both equity and mortage, Federal and state economic development sources and philanthropic sources. The capital cost estimate assumes facility completion in 2017. Three financing strategies are recommended, pooling varying combinations of social impact equity and debt instruments, federal and state economic development sources, New Market Tax Credits(NMTC) and philanthropic funds.

The development of this concept design would not have been possible without the active participation of potential tenants, institutional representatives and interested and highly-motivated Gloucester citizens. Further, the City's planning staff, including Sarah Garcia, Director, Harbor Planning & Development; Tom Daniel, Community Development Director; and Gregg Cademartori, Planning Director, were fully and energetically engaged in the process.

Background & Purpose of the Study

The Concept Design study was initiated to provide a catalyst for waterfront development that both recognizes Gloucester's fishing heritage and promotes a vision that will be economically viable and relevant to the Gloucester community in the 21st century. Narrowly, the study seeks to optimize the value, from a broad community point of view, of the city-owned I4C2 parcel at 65 Rogers Street, fronting on Gloucester harbor.

Gloucester's location and history provide numerous advantages in the design of a multi-tenant center and the recruitment of potential occupants. Gloucester is centrally located on the Gulf of Maine, it is proximate to valuable fishing grounds, significant fishing fleet and marine infrastructure still exists, a reservoir of maritime skills runs deep, the harbor is protected, and the site offers direct harbor access. Gloucester is also within very reasonable travel distance of numerous Boston business and academic communities and their human resources, and there is a robust ocean engineering community in the region, led by the for-profit business sector.

The design team that was hired to undertake the Concept Design study draws deeply on experiences in the design and operation of multi-purpose marine centers. The Gulf of Maine Research Institute, incorporated in 1968 in Portland, ME (population 66,214), built, funded and operates the organization and the building to support a complex mix of ocean engineering consultants, aquaculture product developers, marine researchers, marine policy implementers and public educators in a single 44,000 sf marine center located on the Portland waterfront. Building tenants include:

- A Scottish-based aquaculture health firm that is the world's largest provider of dedicated, evidence-based veterinary services, diagnostic technologies and environmental monitoring to the global aquaculture sector;
- A Scottish-based ocean engineering firm that provides engineering and technical advisory services in onshore and offshore wind, solar, wave, tidal and hydro projects;
- University of Maine researchers who are jointly appointed to GMRI to carry out fishery ecosystem research;
- The U.S. Coast Guard, who operates patrol vessels from the site;
- A multimedia production firm that designs online technology platforms and user experiences that engage the public with complex information; and,
- GMRI, a team of researchers, policy implementers and educators who seek to catalyze solutions to the complex challenge of ocean productivity and sustainability.

The project architect also described a relevant co-located marine center in Newport, OR, a small coastal community with a population of 10,017. The site includes:

- Hatfield Marine Science Center, operated by Oregon State University (OSU);
- OSU Ship Operations;
- Oregon Department of Fish & Wildlife field offices;
- U.S. Fish & Wildlife field offices;
- U.S. Commerce Department offices;
- Oregon Coast Aquarium; and
- NOAA Pacific Coast Marine Operations Center.

While the proposed tenant mix for the Gloucester Marine Innovation Center varies distinctly from GMRI's and Newport, Oregon's mixes, these two examples are relevant to the design, development, funding, construction, operation and sustainability of a sophisticated waterfront marine facility in a moderately-sized coastal community.

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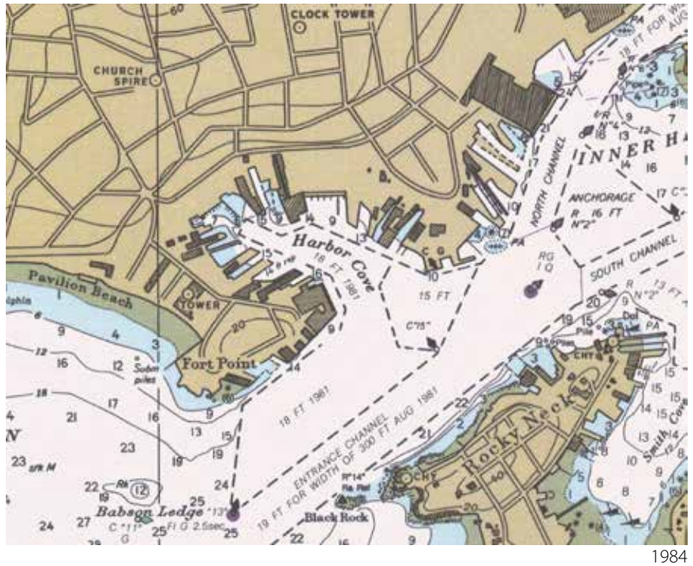

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The Site

The I4C2 site is located on the south side of Rogers Street, the primary commercial thoroughfare for Gloucester's waterfront, and is the only vacant parcel on Gloucester's Harbor Cove, one of the oldest portions of Gloucester's working waterfront. The 1.819 acre site has about 208' of waterfront frontage along its south side. The site is immediately downhill from City Hall and downtown Gloucester, and there are important views from the site to the historic City Hall framed by Parsons Street. The parcel immediately to the West has been developed with a restaurant and conference center. Further West are additional restaurant and seafood businesses. The parcel to the East is The Building Center of Gloucester, a lumber and home improvement retail business. Further East is the Gloucester Harbor Loop, a small historic promontory that hosts the US Coast Guard, Maritime Gloucester, the Gloucester Harbormaster, and other businesses. One block North of the site is the heart of Main Street, location of the majority of Gloucester's pedestrian-oriented shops and restaurants.

There are excellent views of Gloucester Harbor from the I4C2 site. Furthermore, as one of the last empty parcels along the waterfront, it is one of the few places along Rogers Street where there are uninterrupted views of the Harbor. Across Harbor Cove is the heart of Gloucester's fresh catch commercial fishing businesses. Further across the harbor are views of Rocky Neck and the historic and picturesque Tarr and Wonson Paint Manufactory buildings, now inhabited by the Ocean Alliance.

The Site

Conditions and Assessment

The site, vacant since the mid 1960's, is currently owned by the City of Gloucester, and is used for parking with minimal improvements. The surface is dirt and gravel. The edge along the harbor has been improved for the HarborWalk and for public access to the docks, with an improved bulkhead and concrete wharf.

The site topography drops off steeply from Rogers Street and then is mostly flat to the harbor's edge. The edge along Rogers Street slopes from a high point of elevation 18 to a low point of elevation 5. The flat part of the site is roughly elevation 7. The FEMA Base Flood Elevation was recently revised from elevation 9NAVD to elevation 14NAVD, which means the majority of the site is below the FEMA BFE line. The majority of the site also lies below the historic high water mark, and is therefore subject to Massachusetts Chapter 91 and Designated Port Area regulations, which limit its use.

The parcel is located on one of the oldest portions of the waterfront, and was formerly multiple piers. At some point the area between the piers was filled to create a single parcel. The content of the fill is unknown, and is assumed to be of poor bearing capacity. A brief soils report from a single boring found silty clays and sands, and bedrock at just over 40' below the surface. This study assumes that new structures will be supported on piles that extend to bedrock at an average depth of 40'.

It is assumed that the site does not contain any significant contaminants, buried fuel tanks, or other major hazardous materials that would require extensive clean-up. Formerly the property was divided into two parcels with a number of easements allowing access to the waterside parcel. The two sites have been joined into a single parcel and the easements have been removed.

There are major city utilities in Rogers Street, and it is assumed that all utilities needed for the project are readily available.

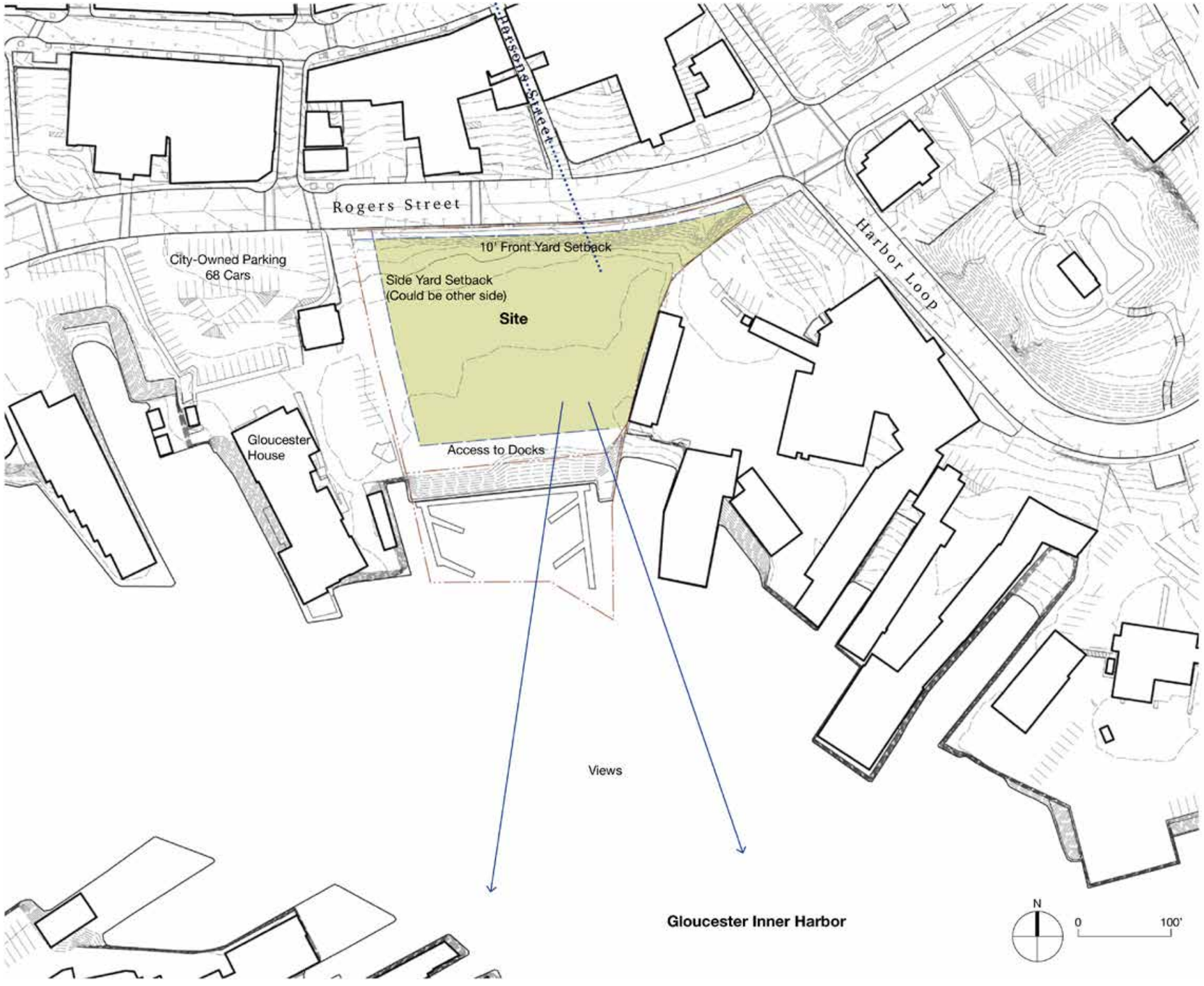
Zoning impacts on development

I4C2 development is currently limited primarily by parking and height restrictions. A summary of zoning restrictions is shown on the adjacent illustration. This development concept assumes a variance from the parking and height restrictions in order to develop a facility that is a feasible size.

Limitations due to parking may be offset somewhat by the possible availability of an adjacent City parking lot for use towards the parking requirement.

Massachusetts Designated Port Area (DPA) regulations and City of Gloucester Marine Industrial Zoning will limit the uses that can be located at I4C2 to water-dependent industrial uses. Our opinion is that the research, educational, and agency groups envisioned as part of this study will qualify as a mix of water-dependent industrial (50% minimum requirement) and supporting uses.

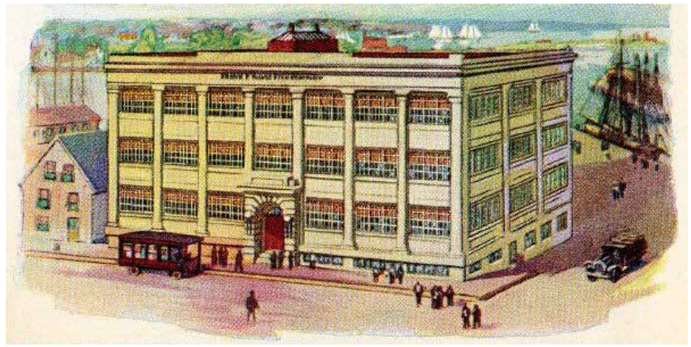
An existing deed restriction may prohibit the creation of a seafood restaurant on site. If a test kitchen is desired in the development, and new products are offered in a manner that is somewhat like a retail operation or restaurant, this restriction will need to be verified.

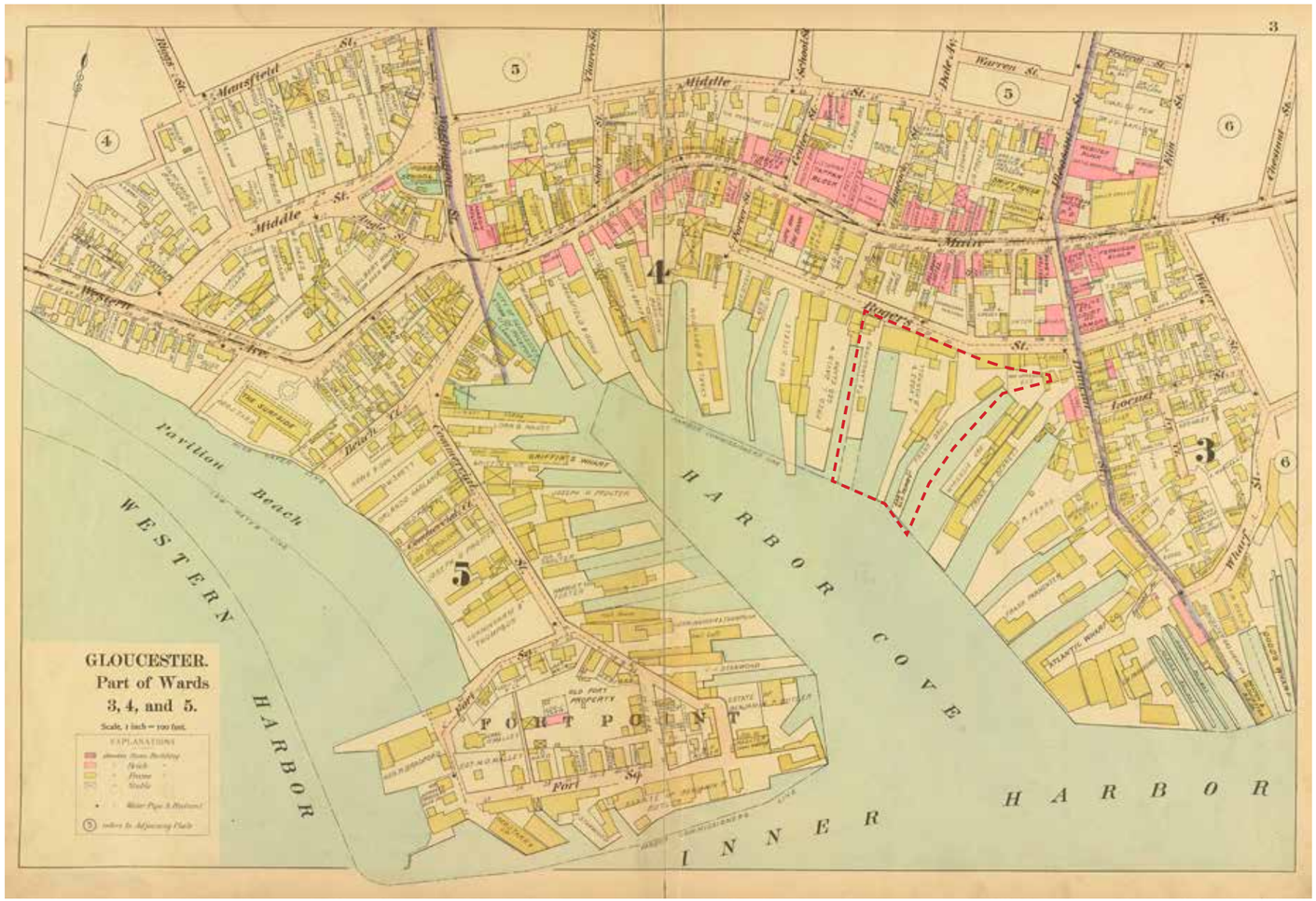


Initial Assumptions/Findings

- Neither sunken nor structured parking are feasible in this location for the size of the project. All off-street parking must be accommodated at grade.
- The City owns an adjacent parking lot of 68 cars immediately to the west of the property. This lot may be available as a parking offset.
- The requirements for parking are sufficient that unless the new building is quite small, some parking will be under the structure, which will be on a platform.
- Considerations of economy will drive schemes that have less structured deck than more – a smaller footprint over parking will be less expensive and therefore more feasible.
- FEMA Base Elevation is Base Elevation 14. Ground floor elevation for the new development must be at 15 or higher. Area beneath the building can be used for parking, storage, and not much else.
- It is desirable to configure the harbor walk in a loop through the site rather than doubling-back on itself.
- Configurations that parallel the wharf fingers are more desirable than configurations that run perpendicular. This is the pattern of the waterfront.
- Public space and public access are desirable, but will need to be limited in scope — large exterior plazas and parks will be expensive to develop and maintain, and may actually be less desirable in bad weather than small spaces.
- Vehicular access to the docks and to a parking lot at grade will be easier on the west side where there is less slope, as it is at present.
- The 40’ height limit and the waterfront pattern both suggest that the building will not be more than two stories above the street.
- The amount of parking that can be accommodated on-site tops out at around 150 cars. 120 or so cars is a more likely outcome, as some of the site will need to be devoted to other uses than parking. If parking on the adjacent city lot is factored in, the development envelope is limited to what will require around 180 cars.
- The parking limitations suggest that the devlopmet size will be around 40,000 to 45,000 gsf if the adjacent lot can be used, and around 30,000 - 35,000 gsf if it cannot.

The Site



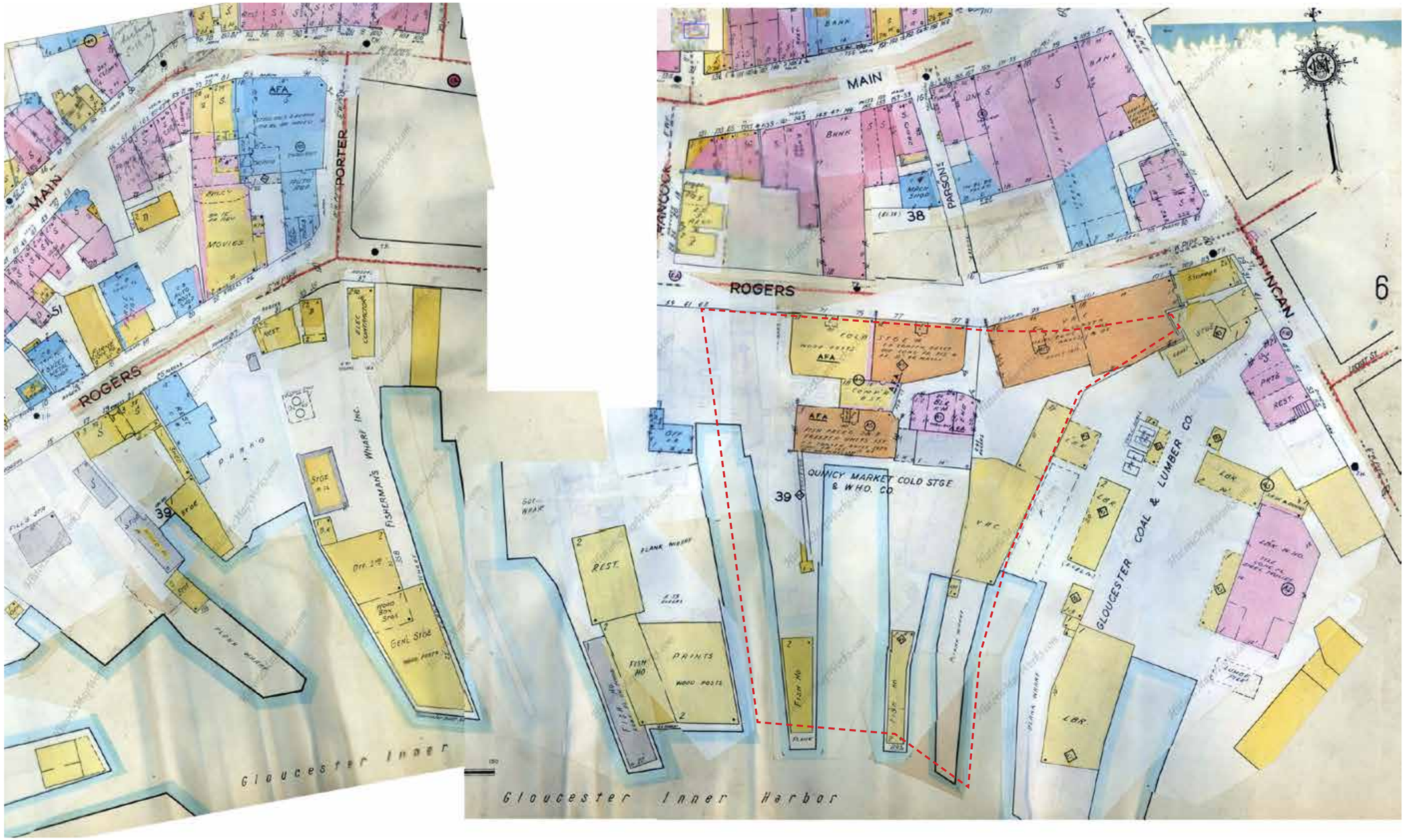


Historic Site Conditions and Precedents

Sanborn and other historic maps show that Gloucester's waterfront developed similarly to other New England historic waterfronts, with long, low, wooden gabled pier buildings extending out along the piers that were spaced according to allow vessel maneuvering space. Main Street was the original thoroughfare for waterfront access, and early Sanborn maps show wood structures on the piers and masonry city buildings along Main Street. Later, Rogers Street was developed as the principal access to this portion of the waterfront, and it subsequently developed with masonry and concrete structures.

The I4C2 site was formerly occupied by the Frank E. Davis Fish Company. Historic photographs show that the Davis Fish Company in the 1940s and 1950s consisted of a grouping of large, four- and five-story concrete frame buildings with glass infill, that were very modern for their era. These commercial buildings faced Rogers Street, with lower pier buildings running parallel to the piers as is the pattern all along the waterfront. The development concept is designed to echo these precedents.

The Site


MAIN
PORTER
ROGERS
FISHERMAN'S WHARF INC.
Gloucester Inner
MAIN
PARSONS
ROGERS
QUINCY MARKET COLD STGE & WHO. CO
GLOUCESTER COAL & LUMBER CO
Gloucester Inner Harbor

Potential Tenant Mix & Requirements

The Gloucester Marine Innovation Center is envisioned as a multi-use, multi-tenant facility that will leverage the synergy of a blend of partners. A key goal is to create a facility with a balanced mix of compatible tenants that will all benefit from the close association. A balanced mix will stimulate innovation and aggregate and leverage intellectual capital. A thriving Innovation Center will create a magnet for economic benefit to other Gloucester businesses.

This study identified potential tenants in three broad categories:

1. Ocean Engineering, which includes groups interested in the development of ocean-related technologies such as ocean energy, remotely-operated vehicles (ROVs) and other submersibles, and remote sensing;
2. Adaptive Fisheries Management, which includes fishing organizations, research institutions, and state and federal agency groups involved in fisheries management; and
3. Ocean Product Development, which involves groups interested in finding new applications for ocean-harvested products and the by-products of fishing.

The workshops identified specific space needs as well as needs that could be shared by all building tenants, including Water Access and Logistics. Per the outcomes of the first workshop, space needs were also characterized for Public Education and Public Amenities.

Space needs identified in the workshops fall into the following categories:

- ***Lab/Workshop Suites:*** There is a general need for workshop-type engineering lab spaces (as opposed to wet chemistry labs) by all the engineering and research groups. Typical is a modular, durable suite of roughly 1,000 sf for the development, assembly and testing of ocean-going equipment. Such a space typically would include a secure storage area and a procedure alcove that would contain equipment/bench space.
- ***Office Space:*** All potential tenants require a certain amount of office space, or computational lab space that is essentially office space. A large portion of the building needs to consist of generic office space that is flexible and adaptable, easily reconfigurable for different sized tenant groups. The office space can be grouped; offices for research groups do not need to be immediately adjacent to their labs. Grouping office suites will help create a good mix of research and agency groups that will be synergistically advantageous.
- ***Test Kitchens:*** Specific to the Ocean Product Development group, the need for a pair of test kitchens was identified, one primarily for food product development, and one that can also be used for teaching and demonstration. These would be roughly 1,500 sf in size and include a small office and storage space.
- ***Shared Tenant Uses and Amenities:*** A number of uses were identified that could be shared by all potential tenants. Ideally these would be distributed in the building in such a way as to encourage interaction between tenants. In addition to the spaces listed below, public areas of the building should be designed with interaction and engagement in mind, incorporating conversation/whiteboard niches, breakout areas, enlarged stair landings, etc. Shared amenities identified include:
  - Large Conference Space: A single large conference space that could be used for large meetings as well as for classes, well-equipped with video and internet connectivity for distance-learning to facilitate connectivity with regional academic institutions and distant corporate and institutional partners.
  - Small Conference Space: A mix of smaller conference spaces that can be used for breakout or impromptu meetings, or scheduled for smaller groups.
  - Break lounge; a meeting/eating/reading space used for lunches and breaks.
  - Coffee nook
  - Lobby
  - Storage
  - High-bay test space: one space for large equipment assembly/prep including a shared test tank where equipment could be submerged and tested in a freshwater tank.
  - Procedure Space with Equipment Space and Hoods ± 400 sf
  - Small Electronics Shop ± 400 sf
  - Small Machine Shop ± 400 sf (larger maching needs can be adequately met through existing local machine shops).
- ***Water Access and Logistics:*** One of the most important benefits to locating a marine innovation center in this location is the direct access to the water. The site offers the advantages of having wharfage, a dockside crane, and on-site vessel storage. It would also be beneficial to provide exterior lay-down/staging areas that would include space for trailers and shipping containers, and interior staging areas and a loading dock.
- ***Public Amenities:*** Development of I4C2, which is currently public property, will need to include public amenities. These could take any of a number of forms; our study includes the following:
  - HarborWalk and view access; the existing HarborWalk should be preserved and enhanced. This study incorporates the existing HarborWalk path into the design of the building, creating a portal that frames views of the harbor and welcomes the public through to the water's edge (see development proposal).
  - Public parking and events: it's possible that the parking area could be used for after-hours or weekend events.
  - Conference/Classroom Space: It's possible that the conference/classroom space in the building could be made available for public meetings and events, particularly during off hours.
  - Visitor Center: this study incorporates a public visitor center into the project. The Visitor Center could include exhibits about the research ongoing in the building and about important issues related to the harbor, to Gloucester, and to the fishing industry. One idea is to have a real-time display of the Gulf of Maine that shows the location of the fishing fleet at that moment, and displays about the current catch. This functionality could be digital in nature, and projected onto the glass such that the building would not need to be open or staffed for this information to be displayed. Access to current data presented in a fresh and automated manner would build public awareness, understanding and support for the commercial fishing industry.

During summer and other high-traffic months, the City may want to consider staffing the lobby of the building as a visitor center. Its highly central location on the waterfront would draw a significant percentage of visitors to downtown Gloucester, and such a staffing function would enable cross-marketing of other Gloucester educational institutions and attractions like Maritime Gloucester and The Schooner Adventure.

These space requirements are shown in the Architectural Space Program.

Conceptual Architectural Space Program

Space Type	Net Area Ea (sf)	Quan	Total (sf)
Vessel Service			
Secure Storage	400	1	400
Interior Staging	2000	1	2,000
			-
Covered general storage	2100	1	2,100
			-
Shared Shop/Wet Space			-
Small Machine Shop	400	1	400
Small Electronics Shop	400	1	400
Procedure space w/hood	400	2	800
			-
Workshop/Lab Suites			-
Workshop	1000		-
Procedure	200		-
Secure Storage	200		-
	1400	5	7,000
			-
Office Suites			-
Offices (5 @150)	750		-
Huddle spaces (2@150)	300		-
Open office (6*80)	480		-
Storage/copier	120		-
	1650	10	16,500
			-
Shared Interaction			-
Lg Conference/Classroom	900	1	900
Sm Conf/Breakout	200	4	800
Break Room/Kitchen	250	1	250
Library	200	1	200
			-
Prep Kitchen			-
Kitchen	1500	2	3,000
Storage/Office	1000	2	2,000
Demonstration/Education	1000	1	1,000
			-
Lobby	1500	1	1,500
Visitor Center	1500	1	1,500
Service dock/staging	500	1	500
Subtotal, sf			41,250
Grossing factor	0.6		16,500
Total Program, gsf			**57,750**

Concept Design Process

The Concept Design process centered on three workshops that sought to engage potential tenants, marine and fishery-related organizations and Gloucester citizens in thinking about and discussing the character of a multi-tenant facility that would situate Gloucester to take advantage of its numerous human and marine assets in the 21st Century. The design team, with major input from Gloucester Harbor, Planning and Development staffs, identified a number of local businesses, as well as companies and institutions in the Greater Boston region who might have strategic interests in becoming a part of the Innovation Center.

Workshop 1

The first workshop, convened on October 1, 2013 in downtown Gloucester, attracted twenty participants in addition to city staff and the design team. Agenda items for the all-day meeting included:

- Description of the intended design process and goals
- Review of the historical site context, including prior uses, current uses, the community design initiative and developer response to site-development RFPs
- Discussion of needs and opportunities, segmented into conversations about the future of fishing, ocean engineering, blue biochemistry, and engaging the public in the ocean century
- Lessons from other waterfronts, including Portland, ME and Newport, OR, including a discussion about Gloucester's potential to emerge as a leader and innovator in fisheries and marine innovation

Participants represented multiple seafood product development businesses, local fishery and maritime organizations, and post-secondary academic institutions from the region and state and local officials.

The general discussion about needs and opportunities raised the following prospects for consideration in the facility:

- Gloucester could take the lead on ecosystem management, a relatively new scientific and regulatory approach, growing a "smart fleet" of boats with both fisherman and scientists on board;
- Gloucester could be positioned as a leader in "green" fishing, applying new tools and processes to reduce bycatch and optimize vessel efficiency;
- Blue chemistry harnessing nutrients from the ocean floor and fish wastes to develop new products and pharmaceutical applications;
- Development and deployment of genomic tools and methods to provide evidence of species type and point of origin to address consumer concerns about mislabeling;
- Operate test kitchens to develop new seafood products and demonstrate processing and cooking techniques;
- An element of community outreach focused on inspiring a new generation who cares for the fishing industry and its associated issues.

This same conversation revealed several community tensions that will need to be managed to design, build and operate a successful facility:

- Tensions inherent between the fishing community and federal regulators, as represented by NOAA/NMFS;
- Tensions inherent between the fishing community and university researchers, as science and policy researchers are often seen as the source of new catch rules and gear restrictions that negatively impact the economic performance of the fishing community;
- Tensions between existing or start-up Gloucester businesses and businesses from the region who may find business justifications to rent space in the proposed Center;
- Strong dislike for tourism as it is seen as an industry that will change Gloucester's maritime roots and reputation as a true fishing port. This tension is tempered by the recognition that it is important to build and sustain a public constituency to support the fishing community.

An important conversation also ensued around the institutional structure and ownership of a resulting multi-tenant facility, with the two options discussed being city ownership and operation or developer ownership and operation. Both options offer trade-offs – the City may be eligible to access funding sources that reduce rental costs to potential tenants, but cities tend to not have expertise in program operations. Developer ownership would remove the city from an operating role, but the developer may not retain the same long-term interests in the founding principles and community interests that underpin the design of the Marine Innovation Center. As planning for the facility proceeds, this question is central and deserves considerably more attention.

Concept Design Process

While the above-described tensions are not to be minimized, participants in Workshop 1 agreed that the status quo, which finds the fishing industry, product developers and university researchers in their own silos, does not support effective interaction. A consensus emerged that a single site and integrated vision might present a breakthrough opportunity for these community segments to interact effectively.

Workshop 2

While the first workshop generated significant feedback about fishing, product-development and public education opportunities, the design team noted the absence of representation from the ocean engineering community. For the second workshop, an emphasis was placed on recruiting potential ocean engineering participants, with four firms participating. This workshop, convened on February 25, 2014 in downtown Gloucester, attracted thirty-three participants in addition to City staff and the design team. The day was divided into four sequential workshop sessions, with the first focusing on Ocean Engineering, the second on Adaptive Fisheries Management & Research, the third on Ocean Product Development, and the fourth on interested community organizations and individuals. Agenda items for the first three panels included a review and status update on the Marine Innovation Center concept, a characterization of the specific niche being discussed, a discussion about facility considerations for that niche, both specific to the potential tenant and opportunities to share common space, and a conversation about the level of interest of each participant in co-locating at the proposed Center. The fourth session, which focused on community organizations and interested citizens, included a review of the project status to date, a characterization and discussion of each of the three proposed niche areas and a fully-engaged question and answer session.

Participants included representatives of ocean engineering firms, ocean products developers, local fishery-related organizations, academic institutions, state and federal agencies, informal education organizations, developers, architects, investors, and interested citizens.

The first session of the workshop explored specific opportunities in Ocean Engineering. Participants commented generally that such a proposed facility provides an attractive opportunity for tenants who need ocean access located north of Boston and Cape Cod/Woods Hole, that water access is particularly important, as ocean engineering tenants will need to be able to unload equipment and various materials from vessels, that a building layout with a paved open space/parking lot between the building and the water would be better for heavy vehicles, forklifts, etc. needed to transport equipment to and from vessels, and all wanted offices and meeting space equipped with technology including whiteboards and media to facilitate presentations and enable international communication with outside partners. Explicit interest in building tenancy was expressed by a growing ocean wave energy development company.

Specific needs of individual potential tenants included:

- end-of-dock launching space;
- dockage space to board research vessels;
- small wet lab with submersion tub;
- open bay with truck access;
- crane for overhead loading;
- secure storage;
- shared lab space for chemical analysis;
- secure, temperature controlled container space; and,
- light industrial/shop space.

The second session considered Adaptive Fisheries Research & Management. Generalized observations from all participants called for ample common space (coffee area, kitchen, etc.) where unscheduled interactions among private tenants, academia, the fishing community and supporting government agencies can occur to the benefit of marine-related activities in the region. Subsequent 1:1 conversations indicated a tension between the desire for a shared facility that facilitates such interactions and the ability to close a door to protect privacy from interruption when needed. This group also noted that there are many fishing community related organizations scattered all over Gloucester in hard-to-find areas. These organizations could relocate to the facility on I4C2 to simplify collaboration and dissemination of information to interested parties, and to learn from each other. This group also identified the need for shared technology-enabled meeting areas for presentations and national and international communications. The group also expressed an interest in the concept of "an experiment of national significance," where the facility and its participating partners could serve as an example for how an ocean community can marshal resources to better understand and respond to a rapidly-changing climate and species shifts in a region.

Specific needs of potential Adaptive Fisheries Management & Research tenants included:

- lab space with a chemical hood, drying oven and sample process area;
- access to RVs, loading dock capabilities for small equipment;
- field offices for visiting researchers/students;
- space to hold wellness programs for fisherman;
- a collaborative management agency within the building to handle bookkeeping, grant writing, and building a culture of collaboration within the building; and
- A federal agency cited possible office needs for local headquarters, enabling better communication with the Gloucester fishing community.

The third session involved potential Ocean Product Development tenants. General comments centered on a strong need for a shared resource to help with complex regulatory issues (EPA, Board of Health, FDA) that confront the food/product development industry. Participants also expressed interest in a test kitchen capacity where interested parties/public/culinary students could be taught to prepare less-caught species and experiment with new recipes. Such a kitchen could also be used for seafood product development, with the understanding that production and distribution would be managed in larger, purpose-built facilities. Participants noted that branded Gloucester Fresh Catch fish could be prepared here for sale, and that such a kitchen might serve to attract young people to work in fishing-related industries. While there was a consensus that such a kitchen would be unlikely to generate adequate funding to sustain its operations, it was perceived that creative partnerships with a culinary program or hospital/school distribution channels might fill the funding gap. Subsequent discussions with thought leaders in the sustainable seafood chef community indicated that a chef with emerging national recognition might be the optimal tenant to provide a financial base for this kitchen concept.

The fourth session of the day welcomed local organizations and interested residents to both share the findings of the preceding sessions and solicit input regarding the current direction of the concept design effort. While the earlier sessions had been purposely structured to elicit specific space needs from each of the three potential tenant sets, some citizens expressed dismay at not being invited to or being excluded from certain

of the earlier workshops. Much of the discussion in this session centered on the development of a new Gloucester incubator-type organization to serve as the anchor tenant and develop and run this facility. Several of the participants also spoke explicitly about meeting community education needs. This conversation ranged from formal middle school and high school programs to after-school programs, public lecture space, free meeting space for local organizations and a café that would accommodate self-employed citizens working from home, among others. The concern about development of capital and operating-cost models running parallel to the building and site design process was also raised. The concept design team responded that these estimates would be a key component of the final concept design report.

Workshop 3

The third and final workshop was convened on May 6th, 2014 in downtown Gloucester. Thirty-three participants attended, in addition to City staff and the design team. Participants represented ocean engineering firms, ocean products developers, local fishery-related organizations, academic institutions, state and federal agencies, informal education organizations, developers, architects, investors, and interested citizens. The agenda for the three niche tenant sessions included a presentation of revised building plans based on tenant and citizen input from the second workshop, a discussion about the extent to which the revised plans address the needs of the potential tenants, a discussion about other potential tenants, the introduction of a non-binding Letter of Interest and a description of the anticipated project development trajectory following completion of the concept design report. The public session agenda was similar, though both presentations and discussion involved a much stronger emphasis on the educational and public amenities of the project.

One new potential tenant in the Ocean Engineering field provided explicit and specific input about his needs, noting that Gloucester's big advantage for his work is that his current location does not include direct access to the water. He described the flexible and modular nature of current ocean engineering practices, noting that he can work out of shipping containers with equipment portfolios that are designed specifically for the current research being undertaken. In addition to engineering needs, he cited the significant student education benefits that could derive from such a center, citing summer camps for young learners as an example.

Another potential ocean engineering tenant was very enthusiastic about both the location and the plan, noting that Gloucester Harbor is vessel-friendly from the perspectives of a protected harbor and marine infrastructure to haul and work on medium-sized vessels. He further commented that Gloucester sits in an ideal location to become a service center for both high-voltage power lines coming across the water from Canada and large offshore floating wind turbines. He echoed enthusiasm for both public education and training capacities at the center.

The second panel, focused on Adaptive Fisheries Management & Research, included both repeat and new potential tenants. One potential tenant expressed concern about current parking requirements on the site, noting that intensive laydown space and vessel operations were being discussed by multiple potential tenants, and that some easing of the requirement to park cars onsite seemed justified. He further observed that the concept design is appealing because it doesn't require that all activities occur on this site, but can also take advantage of Gloucester's extensive existing marine infrastructure. A second potential tenant noted that his institution maintains satellite facilities around the world, and that the particular combination of for-profit, non-profit and federal agency participation is particularly appealing. A federal agency representative described his institution's potential need for small to medium-length vessel dockage or staging, loading and unloading, office space for staffers and an education/outreach capability.

This second panel emphasized both the opportunity and merit of developing strong relationships with one or more academic institutions. Given the interest expressed by private-sector ocean engineering companies, recruitment of an academic institution with a strong engineering focus makes the most sense. Such an alliance would be more likely realized if the Innovation Center includes outstanding remote classroom technology. While an academic ocean engineering tenant is strongly recommended, it is also important to pursue the minor participation of several other academic institutions to seed a multi-institutional team of marine scientists to support the adaptive fisheries collaboration side of the lab. Moreover, over time, one of these individual scientist relationships could stimulate the evolution of a deeper and broader involvement by one of their parent institutions.

The third session of the day sought input from Ocean Product Developers. One high-volume processor of fresh seafood noted that his employer would not be a likely tenant in the building because his processing and distribution operations are large-scale, but that there could be very important synergies between this processor and a test kitchen at the Innovation Center to experiment with new products and new markets for existing seafood landings in Gloucester. This person also reiterated comments by others about the need for high-speed Internet access. Another potential tenant inquired about alignment of the concept design with DPA requirements, to which City Development staff responded that the City would seek DPA certification upon completion of the plan.

The fourth session, which welcomed 25 representatives from community institutions and interested citizens, reflected a great deal of frustration with the economic state of commercial fisheries in New England. Some people took the view that NOAA can't be worked with, some saw the concept design in its current iteration as failing to deal with the issue of the age of Gloucester's fleet, and some expressed a sentiment that there appeared that there would be a great deal of thinking going on, but perhaps not enough doing. Others took a more optimistic view, with one participant noting that "This building can be an enormous catalyst to combining known and new knowledge. Placing these organizations in proximity is a really important way to change up the quality of the conversation." At the first public meeting, one local resident remarked that the I4C2 site is "at risk for being burdened with too many wants and needs, and is being set up as a silver bullet for fixing Gloucester." After this multi-month engagement with potential tenants, community leaders and engaged citizens, it is clear that the community has placed great hope in the prospects for the I4C2 site. A thoughtful, carefully-analyzed plan, successfully executed, can validate the City's decision to have acquired this signature property.

Development Concept

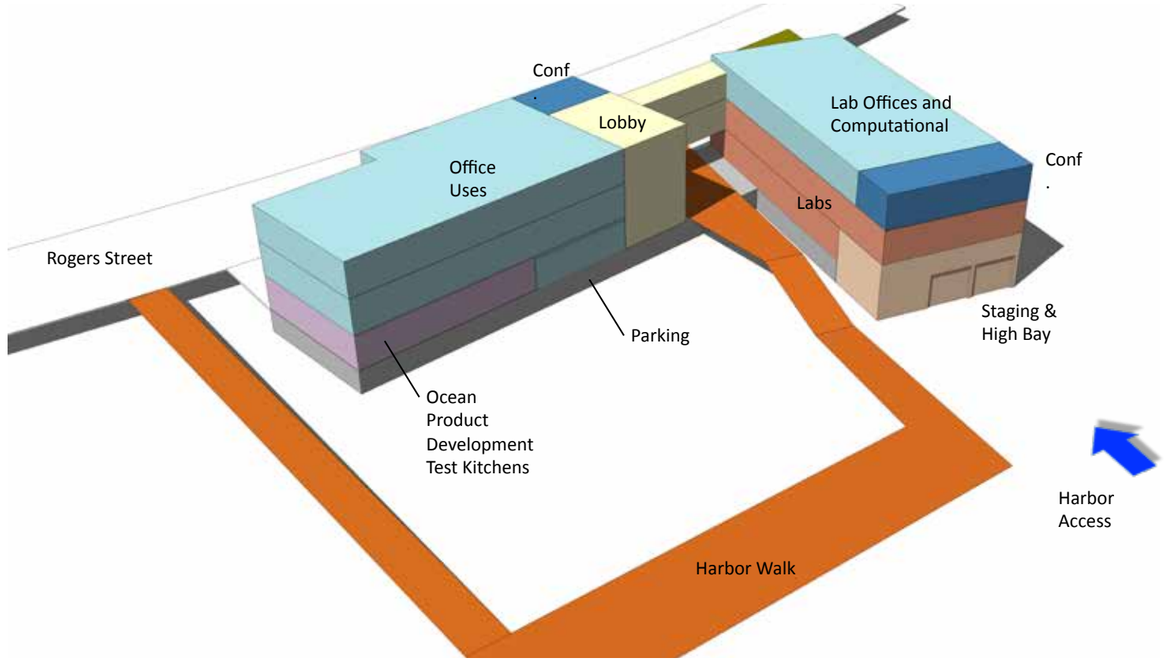
The development concept outlined in this report is just one of many potential solutions for development of I4C2, and is meant to be illustrative of what could be built – not as a specific proposal. Perhaps most important, the City has a choice between making the site available for highest and best use development (likely a mix of retail, tourism, and professional offices) vs. taking the more challenging, but potentially more impactful, path of supporting the creative development of a mission-driven facility designed to contribute to Gloucester's evolution as a 21st Century maritime community. The design team was selected for its experience developing the latter mission-driven approach, and the concept outlined in this report provides an example of how I4C2 could serve as the venue for a remarkable waterfront facility. The final development will undoubtedly differ from what is illustrated in the following diagrams and renderings.

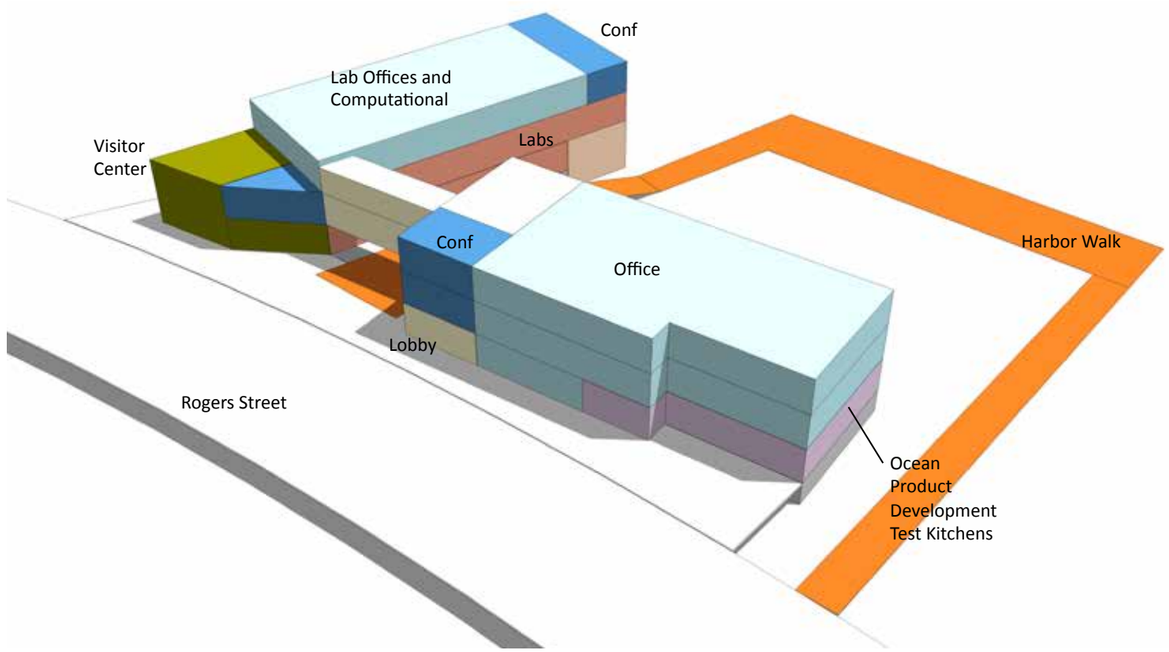
Parking

A preliminary study examined how much space could be built within the existing zoning parameters. Parking and height restrictions limit the building to roughly 30,000 to 35,000 gsf. If the adjacent parking lot is allowed as an offset to the parking requirement, the buildable area increases to 40,000 to 45,000 gsf, depending on uses. Our belief is that the building will need to be larger than 50,000 gsf in order to be feasible. Our observation is that parking regulations in other waterfront districts are far less restrictive, and that an argument can be made to relax the parking based on comparisons to similar facilities, such as the GMRI in Portland, ME and on the experience of waterfront parking requirements in other historic New England waterfront communities like Portsmouth, NH. We would strongly recommend that the City consider amending parking requirements for the site in order to allow for greater development.

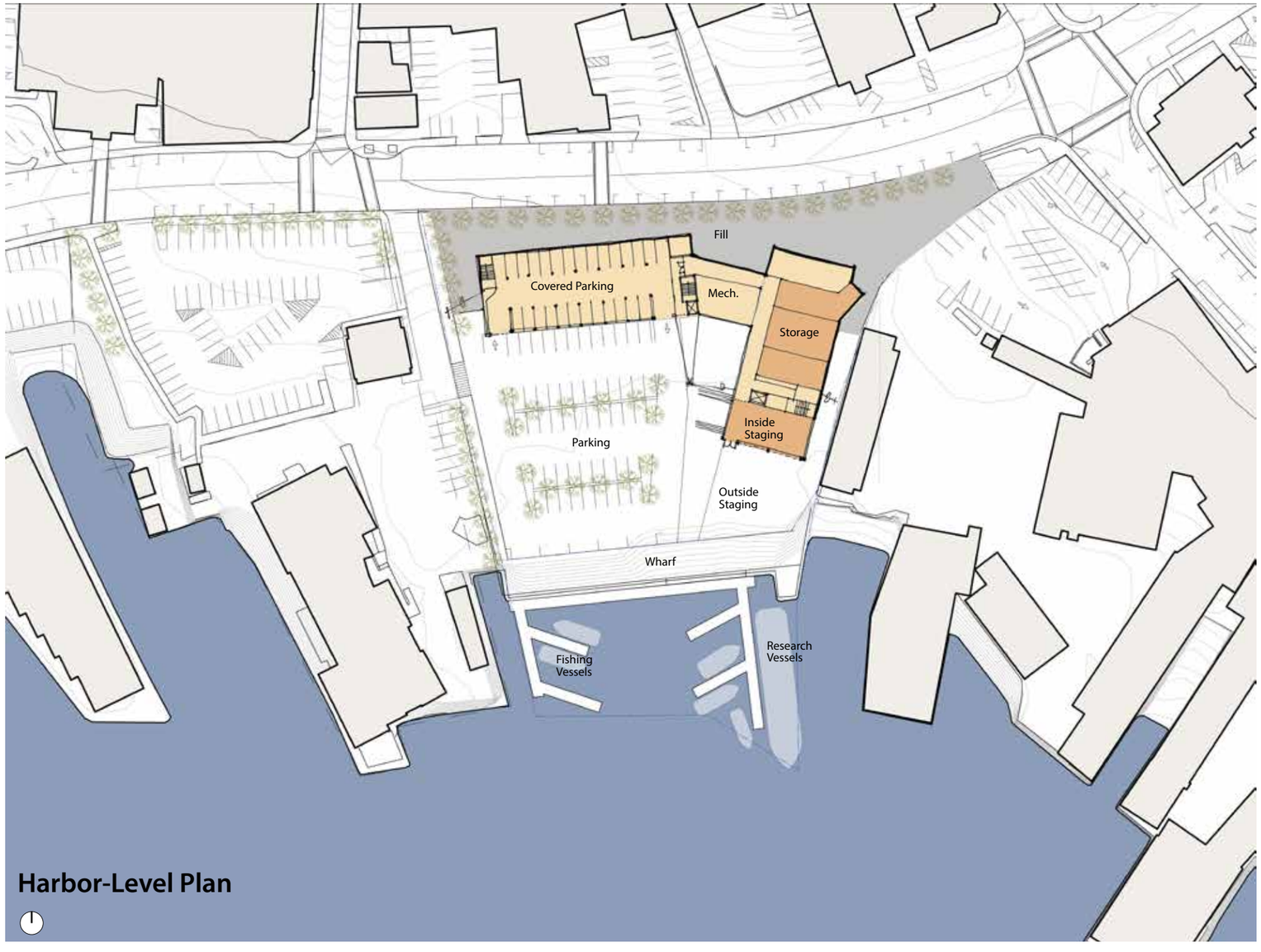
Height

The current zoning height limit restricts the building to two stories over a level devoted to parking and storage. Our opinion is that the project will be economically more feasible and a better urban design at three stories. As a result, a second critical recommendation is that the City should allow a height exemption or should amend the height restriction on the site to at least 50 ft. in order to address this need and remove it as an unknown development risk. A preliminary viewshed analysis suggests that impacts on up-slope views will be minimal due to the height of development on the upland side of Rogers Street.





Development Concept



Harbor-Level Plan

GMRI faced the same challenge of City of Portland height restrictions that would only allow for two stories of development. GMRI sought and ultimately secured a site variance to 50 ft. to allow for three stories of development, though the entire project was put on hold during the variance process and was put at extreme risk by a tie vote at the Zoning Board of Appeals level that ultimately required resolution by the Portland City Council (8-1 vote in favor of changing the height restriction). This process took a year and created grave uncertainty for the development of GMRI. Proactive action on this issue by the City of Gloucester would be extremely helpful to reducing development risk and timelines and, as a collateral risk, reducing financing risk by reducing overall uncertainty.

Orientation

Numerous variations were studied for how the building could be placed on the site, and many had merits. For this study, it was felt that the schemes that engaged Rogers Street and reinforced its streetwall had the most positive impacts on the urban design of the site, with the caveat that the building would need to address the views to the harbor from Rogers Street through transparency and framed openings.

The Program Stack Diagrams and conceptual floor plans illustrate the overall massing and the distribution of the major program elements. The building concept is divided into two wings, one parallel to Rogers Street, containing primarily office-type uses and the product development test kitchens, and one perpendicular to Rogers Street, primarily devoted to research uses and access to the wharf. The two wings are connected on the upper floors; the street level is split, allowing public access via the HarborWalk down to the water's edge, and framing views of the harbor from Rogers Street.

Development Concept

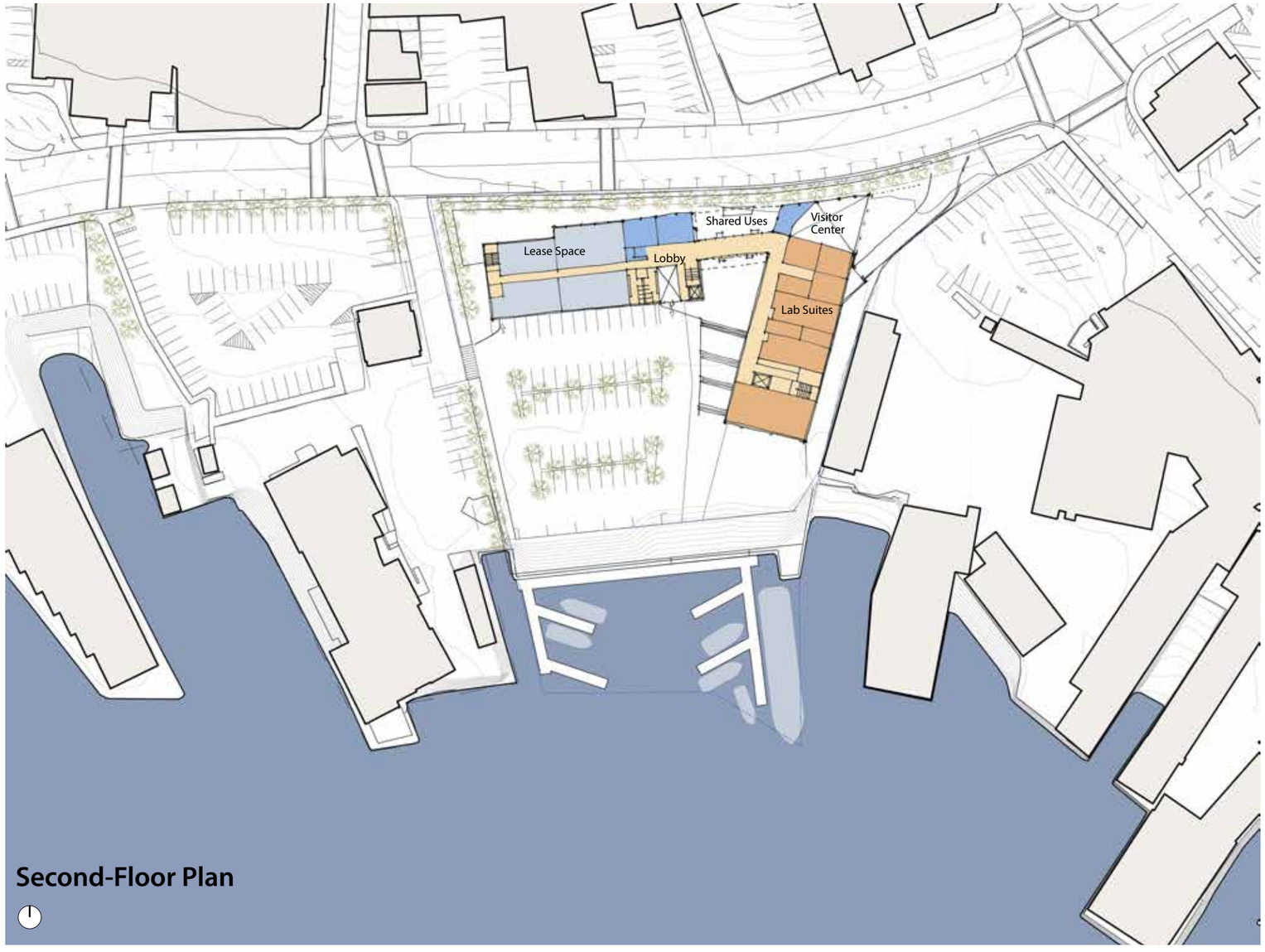
Uses

The ground level, or Harbor Level, located below the FEMA Base Flood Elevation, is devoted primarily to covered parking, storage, mechanical, and access to the wharf. There is an outside staging area envisioned which would enable exterior storage and a logistics area for material being loaded onto, or off of, vessels. We anticipate that the parking area could be an area used for more than just parking; if configured correctly, it could be used as a large lay-down area for both researchers and fishermen, and could also be made attractive for evening and weekend public uses when the building is lightly occupied. Similarly, the Harbor Walk and adjacent areas would be accessible to the public, creating a unique public-private interface.

The first floor, or Street Level, contains the main entrance and lobby to the building, and other public or semi-public uses that relate to the street, such as the visitor center. Concentrating these uses along Rogers Street will contribute to an active pedestrian experience.

Street-Level Plan

Development Concept



Second-Floor Plan

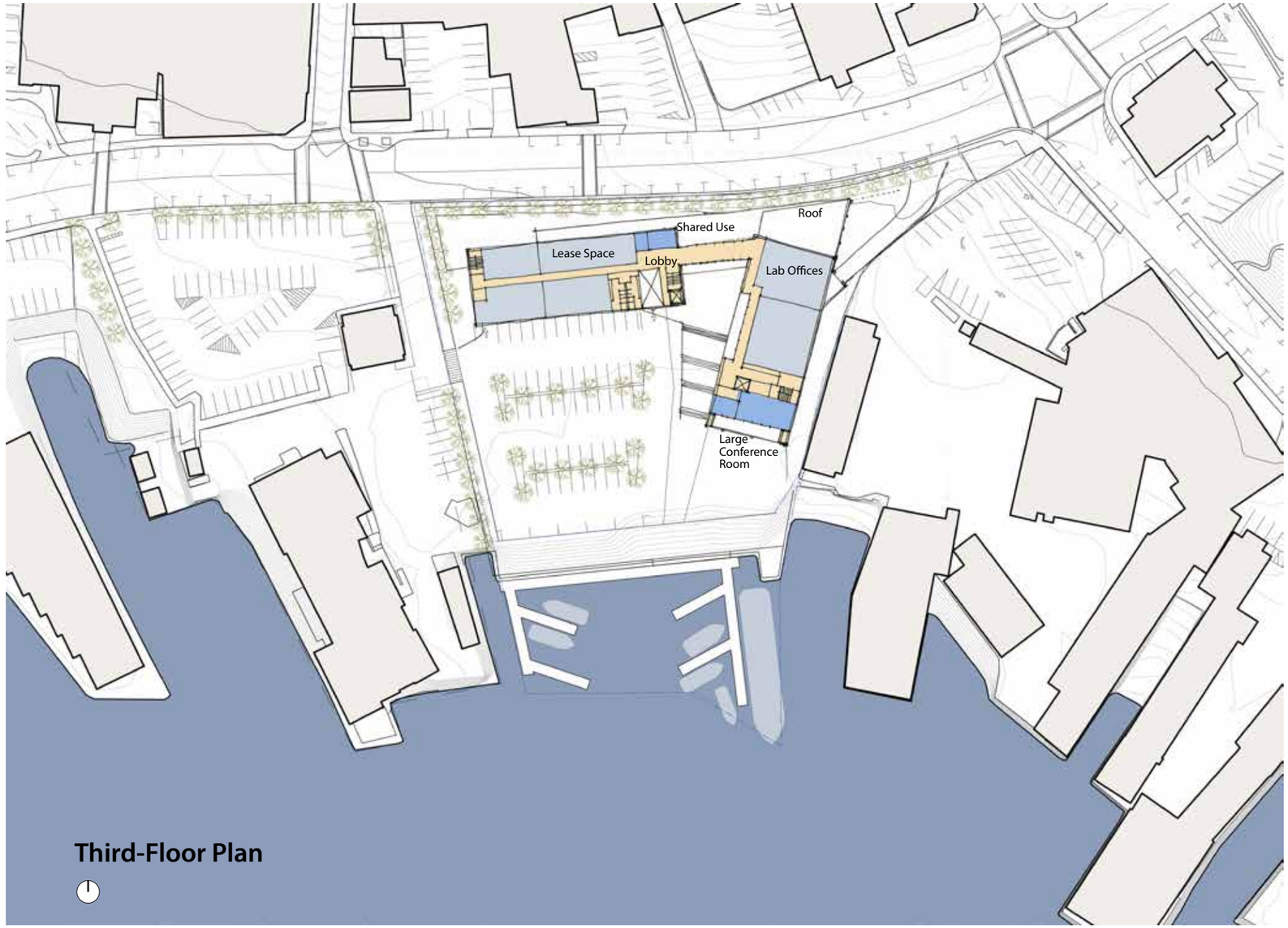
The two upper floors contain a mix of office suites, laboratories, and shared amenities such as conference space. In general, these shared uses are clustered near the multi-story lobby to encourage the sorts of chance encounters and collisions among occupants that lead to the fertile exchange of ideas and innovation. A large conference space is envisioned at the prominent end of the lab wing which would have fantastic views across Gloucester Harbor. Generic, flexible office construction would be provided for the office suites, allowing for different tenants and configurations over time. In the building wing that has primarily laboratories, these would be computational labs (primarily computer use in an office-like environment) and office suites for researchers.

The concept design is envisioned as a unique waterfront development that welcomes the public, and the fishing community, and makes visible and literal the connections among fishing, research, and public agencies and institutions. The conceptual design envisions a structure that relates to the historical qualities of the site's development, harmonizes with Gloucester's harborfront development, both past and present, yet speaks to the future and to the nature of the institutions housed within. It should be a dynamic and transparent building that frames and enhances views to the harbor while reinforcing the building line of Rogers Street. It is designed to be a place to attract agency, institutional, and local industry tenants who will value the location, the access to the water, and the synergistic, beneficial effects of co-location.

Development Concept

Sustainability

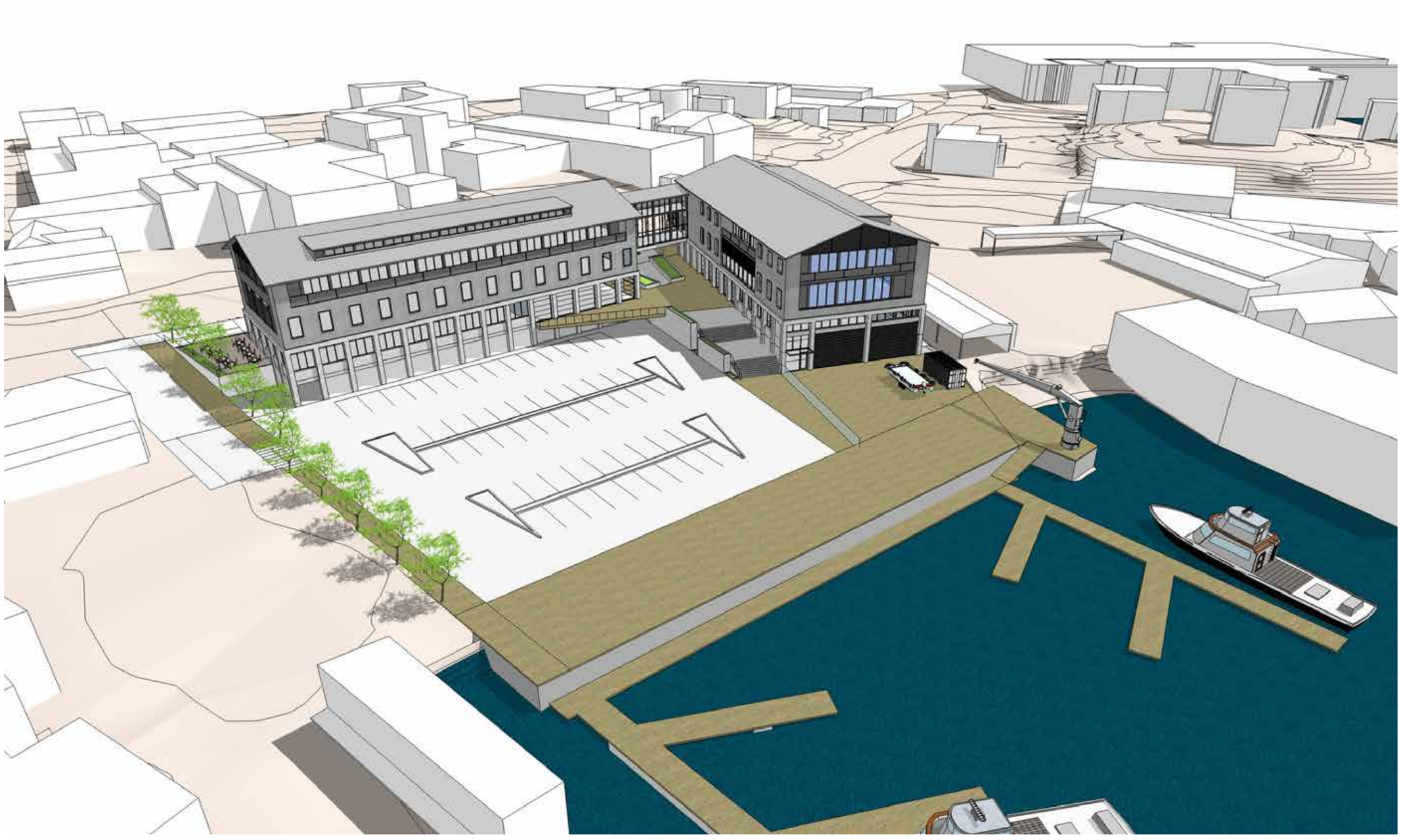
How the design addresses sustainability will be an important aspect of the project. The development should target sustainability strategies that are focused on the mission of the innovation center; reducing carbon footprint and energy use, and addressing water runoff and water quality. Incorporating on-site power generation such as photovoltaic panels would be appropriate, perhaps as shade structures for the parking area. A high-performance building envelope and mechanical system, passive ventilation strategies, and careful daylighting strategies can reduce energy use. Retaining and treating on-site stormwater through the use of bio-retention structures and perhaps green roofs would also be appropriate. Exact strategies would be developed as part of the actual design's development. We recommend adopting a standard for green development such as LEED or Living Building Challenge as part of the RFP.



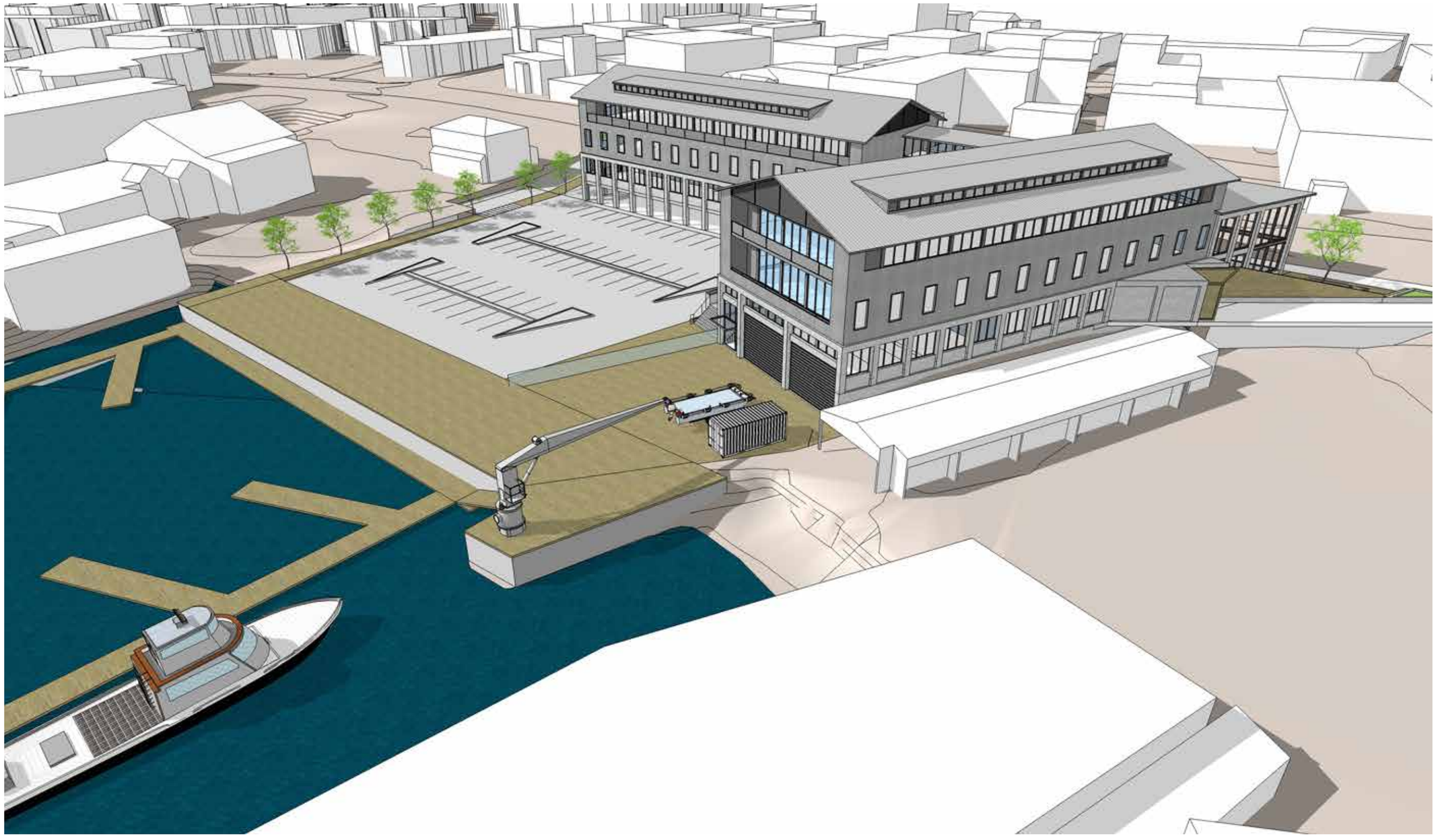
Development Concept

Development Concept

Development Concept



Development Concept



Development Organization, Project Financing Strategy, Facility Pro Forma Operations

The development, financing, and operations of a mission-oriented marine innovation center and the City's RFP strategy are all tightly intertwined. The mission of the facility determines the building requirements, capital costs, potential leasing levels, alternative funding sources, and operations management requirements. Equally important, the mission will be best served by a mission-relevant development approach and overarching long-term management approach. Last but not least, the successful development of a mission-focused facility will either be facilitated or undermined by a nuanced RFP process that elicits rather than scares off appropriate development partnerships. Each of these considerations is addressed separately in this section, and then tied back together in a project development timeline.

Marine Innovation Center Development Organizational Structure

Development of a mission-oriented Gloucester Marine Innovation Center will not be driven by market demand. It will require the aggressive pursuit of a variety of funding sources in order to be financially feasible. In addition to funding subsidies, it will require a hybrid development organizational structure to address both the specific demands of real estate development/management needs and the long-term tenant recruitment, social management, and financial needs of fulfilling an Innovation Center vision and mission.

City officials have clearly signaled that the City is not interested in fulfilling the role of developer. As a result, the City issued an RFP seeking developers for the I4C2 and received no responses. Feedback suggested barriers to development included the complex regulatory environment, numerous public objectives, and lack of permitting clarity. The disposition method was limited to a land lease option and information was lacking on elements of the site including structural and geotechnical data.

This conceptual study advances the analysis of the site and addresses some of the potential development barriers. Moreover, it identifies the challenges that remain. It is unlikely the traditional development community will be motivated to deal with the challenges of the site, equipped to express a vision of a waterfront maritime innovation center that reflects Gloucester's maritime heritage and contemplates its maritime future, or structured to develop a blended capital business model that is financially viable over time. Nationally, the scarcity of models for maritime innovation centers (in general, and that have been successfully sustained over time) indicates that such a center requires a highly nuanced approach. Thus a unique organizational structure is required.

Three potential models deserve consideration and any RFP should be crafted to inspire such models and reward proposals that display such models:

- *Maritime Institution as Developer with Design/Build and Management Partners* – A successful public or non-profit marine research/technology/education institution (e.g., university with marine science and/or technology interests, independent research institute, or marine technology incubator with sophisticated business and real estate acumen) would have the marine market knowledge, blended capital funding expertise (equity, tax–exempt or tax-credit enhanced debt, federal, state, philanthropic), public purpose, real estate development/management expertise, political sensitivity, board resources, long-term vision, internal motivation, and patience required to successfully develop and operate a unique marine innovation facility. Depending on such an institution's management philosophy, it may either outsource facility development to a real estate development partner or manage development of the facility itself by retaining and managing separate fundraising, design, construction, and real estate management services.
- *Developer with Non-Profit Mission Partner* – There is a small but sophisticated community of developers in New England with successful track records developing mission-oriented real estate. They have cleverly assembled unique blends of capital, either found a lead and dominant mission-relevant tenant or created a non-profit management entity to manage the process of fulfilling the vision for the facility, and managed the real estate development process with private sector discipline combined with an appreciation for the multiple bottom line rewards of such projects. The imagination of this community could be inspired if the City crafted an RFP that placed substantial priority and proposal review value on a developer finding or creating a mission-oriented partner with the governance and blended capital expertise to respond to community aspirations, navigate community tensions, and fulfill the social vision for a maritime innovation center over a long time period.
- *Non-Profit Mission-Oriented Organization with Development Partner* – There is a very small community of marine community organizations in the region that might be inspired and capable of selecting and managing a strong real estate development partner to fund and build the proposed marine innovation center. On a related note, a group of Gloucester community leaders might be inspired to form such a marine community organization themselves, given the intensity of Gloucester community interest in this project and the I4C2 site. While start-ups have their own attendant risks, GMRI grew out of a marine community organization founded by local community leaders and serves as confirmation that this path can lead to success. A partnership led by a non-profit, and served by a developer, could assemble unique blends of capital, find a lead tenant, assemble a mix of tenants, manage the real estate development process with private sector discipline, and manage the long-term tenant mix and tenant relationships to realize the project's marine innovation vision.

Development Organization, Project Financing Strategy, Facility Pro Forma Operations

While the City may get strong pushback from traditional developers that these three approaches are unusual, cumbersome, and risky, such a creative approach will be essential if City leaders and the Gloucester community want to see I4C2 develop as a focal point and catalyst for the evolution of a creative maritime-oriented waterfront economy rather than go the "highest and best use" way of most former working waterfronts. The City has the leadership, will, and sophistication to take such a creative approach. The real risk is losing I4C2 to a use that does not serve as a catalyst for the evolution of Gloucester's 21st Century working waterfront, or seeing the site remain vacant.

Project Cost Estimate

The design team has developed a facility design concept in response to City priorities, community interests, maritime tenant opportunities, and its experience assembling a facility and funding that achieve an aspiration and vision for a sophisticated, community-attuned institution. The resulting design concept and the inherent cost of building on a waterfront in turn produce a soft and hard cost estimate. The resulting project cost requires an upfront capital funding strategy and long-term operations strategy that produce a viable marine innovation center. The capital cost is addressed in this section, with project finance and long-term operations management addressed in the following sections.

The functional requirements of the design concept resemble those of many marine research and scientific research facilities – an assemblage of special purpose lab space, flexible office space, public space, and shared special purpose space (that all tenants want access to but won't use full-time and can't afford to shoulder the full cost), all of which is built on pilings. Given GMRI's experience addressing these same requirements, the design team used GMRI's project cost structure as its base case, drew on construction industry advice on annual cost escalation to budget in 2017 dollars (presumed completion year) and adjust from Portland construction costs to Gloucester construction costs. We then back-checked resulting project cost estimates with other comparable projects in the Northeast and Northwest that have been completed in recent years. The result is the project cost estimate shown on the following page.

The project cost estimate is approximately $28.9 million (in 2017 dollars), comprised of 19% soft costs and 81% construction costs, and implying a unit cost of $78/sq. ft. for soft costs, $421/sq. ft. for construction costs, and $500/sq. ft. for total project costs (again, in 2017 dollars). These unit costs will seem high when compared to typical commercial real estate, but compare favorably to other mixed-use, waterfront laboratories developed on the east coast. The site conditions and functional building requirements for this concept design will lead to an expensive project. Moreover, we have erred on the conservative side on the theory that a funding solution designed for a costly facility is easy to downsize if ultimate costs come in lower than estimated as ultimate tenant requirements are characterized and addressed (e.g., the ultimate proportion of lab vs. office space, investment in site improvements to accommodate the public, etc.).

The costs enumerated in this report are for this particular conceptual design that arose from our discussions with potential tenants, community workshops, and the design team's experience. Presuming the City puts out an RFP to select a team to develop I4C2 to serve a significant marine innovation mission, the development team will take its own unique approach to this opportunity, may or may not agree with our recommendation to target the four clusters of tenants we have suggested, and will design their own unique facility that will inevitably have its own soft cost and construction cost structure.

Of particular note, we are recommending that the City increase building height restrictions, decrease parking requirements, and seek funding to complete a geotechnical investigation and a site survey in advance of re-leasing its RFP in order to reduce development risk and attract a broader field of development proposals. If these steps are taken, the related soft costs (Geotechnical, Site Survey, Permitting, Legal/Accounting, and Contingency) will decrease significantly. More importantly, the perception of risk that scared developers away from the City's prior RFP will be reduced and the City will benefit from a broader choice in development proposals for I4C2.

The facility resulting from this capital investment will be unique, highly capable, and well-built to insure performance over time and relatively low maintenance costs. It would provide a highly attractive focal point for Gloucester's extraordinary working waterfront.

For purposes of this report and the City's consideration of how to proceed with development of I4C2, the most important consideration about project capital costs is whether they can be financed successfully and tenants assembled to serve a marine innovation purpose. To this end, a finance strategy for the Gloucester Marine Innovation Center project is addressed in the following section.

Project Cost Estimate

Soft Costs	
Architecture & Engineering	$ 2,491,563
Construction Manager	71,476
Geotechnical	61,793
Site Survey	35,801
Communications Technology Design	26,471
MIS/Telephone	26,471
Traffic Engineering	26,471
Permitting	200,994
Cost Estimating	73,527
Inspections	45,495
Record Drawings	9,728
Legal/Accounting	308,644
Interest	65,001
Furnishings	754,936
Opening	99,932
Contingency	214,915
Subtotal Soft Costs	**$ 4,513,217**
Construction Costs	
Concrete	$ 1,233,695
Conveying System	171,831
Doors & Windows	1,480,103
Electrical	3,096,801
Equipment	89,005
Finishes	2,350,863
Furnishings	167,546
General Requirements	1,950,264
Masonry	278,149
Mechanical	2,835,991
Metals	2,295,506
Miscelleous	206,087
Sitework/Parking	729,018
Sitework	1,699,598
Special Construction	622,950
Specialties	554,878
Thermal & Moisture Protection	2,296,095
Telephone/MIS	437,622
Wood & Plastics	680,782
Contingency	1,158,839
Subtotal Construction Costs	**$ 24,335,623**
Total Costs	**$ 28,848,840**

Development Organization, Project Financing Strategy, Facility Pro Forma Operations

Project Finance Strategy

As noted in a prior section, there are precious few marine innovation centers built and operational on working waterfronts around the country. The cost of building a special purpose R&D facility on waterfront sediment is prohibitive. The marine research and technology market is fragmented and thin. Competition from retail, residential, and tourism development is intense. As a result, the market does not produce marine innovation centers organically. Thus an institution or community inspired to develop a waterfront marine innovation center must inevitably take a creative approach to assembling a blend of capital to bridge the gap between what tenants can afford for leasing rates and the cost of building such a facility.

Based on the design team's experience, the City's interest in seeing I4C2 developed with a marine innovation mission, the potential for the Mayor to play a key leadership role engaging state and federal legislative leadership to assemble public funding, the state and federal tax incentives that we expect to be available during the period that I4C2 is developed, and the broad array of funding sources available to a development team structured as recommended above (development team comprised of at least two parties, one a non-profit or public marine community organization or research institution and the second a seasoned real-estate development institution), the following project finance strategies represent a range of strategies, some hybrid of which would prove feasible and provide the resources to design and build an extraordinary marine innovation center:

Option 1:

- Social Impact Investment – Equity ($6 million – 21% of project cost): Social impact investment refers to a growing trend of charitable foundations, individual donors, and corporate donors who support mission-oriented enterprises with equity or debt that is structured on more favorable terms than conventional financing terms; in essence, they are seeking a measurable social or environmental impact alongside their financial return, and thus discount their expectation on financial return in order to also secure environmental and/or social equity returns. A growing segment of the social impact investment market is looking for opportunities to invest in institutions and businesses with potential to play a leading role in the transformation of our traditional high volume/low value commodity fishing economy to a low volume/responsibly harvested/high value/locally consumed fishing economy. Despite such interest, there are very few attractive investment opportunities in the fishing economy due to the high degree of regulatory, scientific, and political risk. The Gloucester Marine Innovation Center has the potential to be a highly attractive investment opportunity as it is an investment backed ultimately by a real estate asset and offers a unique, positive vision for drawing on Gloucester's fishing heritage to transform Gloucester's working waterfront. (Note: This market did not exist when GMRI built its lab in Portland and it represents an extraordinary opportunity for financing a portion of this project).
- Social Impact Investment – Mortgage ($6 million – 21% of project cost): The social impact investment market is growing increasingly sophisticated in developing a blended capital approach that can include equity, debt, public, and philanthropic layers of capital. Current lending rates for social impact-sourced loans range from 2% - 5%. Our operating pro forma assumes a 3.5% interest rate. (Note: GMRI funded 23% of its project's costs for its lab with a tax-credit enhanced mortgage with comparable interest rate).
- Federal Economic Development Sources ($6 million – 21% of project cost): The Massachusetts congressional delegation is aggressive and effective at securing federal funding for high priority public interest projects, particularly in the context of ongoing crises in the fishing industry. With the Mayor's active leadership in coordination with the development team lobbying the Governor and congressional delegation, Gloucester could assemble a significant portion of project costs from public agency sources. (Note: GMRI funded 16% of its project's costs for its lab from federal sources; at the time, Maine's congressional delegation was not as aggressive as the Massachusetts delegation and we lacked the City of Portland's support for our efforts).
- State Economic Development Sources ($6 million – 21% of project cost): The State of Massachusetts is aggressive in providing state funding for economic development projects and has been focused on supporting the groundfish industry through its current crisis. With the Mayor's active leadership in coordination with the development team lobbying the Governor and the Legislature, Gloucester could assemble a significant portion of project costs from MASSDevelopment and direct earmarks by the Massachusetts Legislature. (Note: GMRI funded 28% of its project's costs for its lab through direct cash grants secured through state research and development bonds; at the time, we lacked the City of Portland's support for our efforts and in fact were competing directly with them for state bond support).
- New Market Tax Credit ($0): This first project finance option is designed to finance the project in the event that the project, as ultimately designed, does not qualify for New Market Tax Credits (NMTC), NMTC are not extended by Congress, or the development team is unable to compete for NMTC support among increased interest in NMTC and limited NMTC allotment.

PROJECT FINANCE STRATEGIES	Option 1		Option 2		Option 3	
Social Impact Investment - Equity	$ 6,000,000	21%	-	0%	$ 6,000,000	21%
Social Impact Investment - Mortgage	6,000,000	21%	$ 6,000,000	21%	6,000,000	21%
Federal Economic Development Sources	6,000,000	21%	6,000,000	21%	-	0%
State Economic Developments Sources	6,000,000	21%	6,000,000	21%	6,000,000	21%
New Market Tax Credit	-	0%	7,039,728	24%	8,888,328	31%
Philanthropic Contributions	4,848,840	17%	3,809,113	13%	1,960,513	7%
Other	-	0%	-	0%	-	0%
Total Sources	**$ 28,848,840**	100%	**$ 28,848,840**	100%	**$ 28,848,840**	100%

Development Organization, Project Financing Strategy, Facility Pro Forma Operations

- Philanthropic Contributions ($4.8 million – 17% of project cost): We are recommending a modest capital campaign as part of the project financing strategy for three reasons: (1) the Gloucester Marine Innovation Center is a compelling project for families and corporations interested in the marine economy, concerned that Gloucester not forget its maritime heritage and indeed leverage its heritage as an asset as it envisions its future, and inclined to take a positive view that Gloucester's fishing industry has the potential to transform and provide opportunity rather than diminish and disappear; (2) the northeastern Massachusetts philanthropic market has deep capacity; and, (3) the community of donors to such a capital campaign, if stewarded properly, would become a resource for funding future needs and opportunities. (Note: GMRI funded 33% of its project's costs through its first ever capital campaign, despite the lack of City support, intense competition from other capital campaigns underway at the time, and opposition from other non-profit boards in the Portland community).
- Other ($0): There will inevitably be other funding sources identified and tapped (e.g., potential state new market tax credits).

Option 2:

- New Market Tax Credit ($7.0 million – 24% of project costs): The major change in this project finance option is the use of New Market Tax Credits (NMTC) to fund 25% of project costs. NMTCs provide a 39% federal tax credit over a seven year period (5%/year for three years followed by 6%/year for four years). NMTC are currently yielding 79 cents of cash per dollar of credit. All other project funds except federal funds are pooled to determine the capital base against which the 39% credit is applied. The size of the pool determines the NMTC benefit to the project. Federal contributions to the project cannot be expected to qualify for inclusion in the pool.
- In this option, NMTCs are used to replace social impact investment equity and reduce the philanthropic contributions goal to $3.8 million (13% of project costs), on the theory that these two funding layers may be the most challenging sources. Alternatively, social impact investment equity could be pursued to eliminate the need for philanthropic contributions; while this would avoid the hard work of a capital campaign, it would deny the Gloucester Marine Innovation Center the benefit of a philanthropic community to steward and draw support from for future needs and opportunities.
- Other ($0): There may be an opportunity to also secure state new market tax credits.

Option 3:

- New Market Tax Credit ($8.9 million – 31% of project costs): The major change in this project finance option is elimination of federal funding by securing social impact investment equity. This increases the size of the investment pool that qualifies for NMTC enhancement, and hence increases the NMTC contribution by $2.2 million.
- Increased NMTCs are used to further reduce the philanthropic contributions goal to $3.1 million (7% of project costs). This would reduce the magnitude of the capital campaign effort but still provide the Gloucester Marine Innovation Center with the benefit of a philanthropic community to steward and draw support from for future needs and opportunities.
- Other ($0): There may be an opportunity to also secure state new market tax credits.

As can be seen from these various project finance options, a development team consisting of a non-profit or public marine community organization or research institute and skilled real estate developer has the potential to assemble a blended mix of funding sources to build the Gloucester Marine Innovation Center. The team selected to undertake this project will inevitably develop their own strategy that will differ from the strategy outlined above, but the point is that financing this project with a blend of capital is feasible.

Facility Pro Forma Operations

Each of the project finance strategies outlined above include $6 million in social impact mortgage financing. The key questions regarding pro forma operations of the Gloucester Marine Innovation Center are: (1) can an appropriate mix of tenants be found to realize the purpose of the facility; (2) will they pay lease rates that will cover the cost of operations and debt service for the facility?

Regarding the first question of tenant potential, the real estate market for marine innovation tenants is thin and the needs and financial capacity of various segments of this market vary enormously. Nonetheless, a significant number of potential tenants were identified during the conceptual design process, participated in the process, and expressed an interest in potentially occupying the Gloucester Marine Innovation Center if it is developed.

GMRI's experience was that once they committed to developing their lab and communicated their commitment to the marine research and development community, they secured a mix of private, non-profit, and public tenants quite easily and had to turn one major tenant down for lack of sufficient space. Equally important, GMRI has demonstrated success in replacing tenants when existing tenants have not renewed their leases or exited leases early due to acquisitions or consolidations related to the recent recession.

Regarding the second question of whether tenants will pay lease repayments sufficient to cover operating expenses and debt service, the design team developed a pro forma projection for the Gloucester Marine Innovation Center that indicates that it can operate and support modest debt successfully. It is challenging to identify what lease rates can be supported as the marine innovation market is thin and there are few comparables. A facility designed to bring a strategic mix of tenants together to collaborate and share facilities offers enormous intangible benefits that are difficult to value. Ultimately, the design team decided to use a base office space rate of $18/sf modified gross (GMRI's current rate), a test kitchen base office rate of $24/sf modified gross (rates currently charged in the Portland, OR area for similar facilities), and $28/sf modified gross for lab space (GMRI's current rate) based on lease rates in northeastern Massachusetts and GMRI's experience of finding tenants who will pay a premium to locate in a mixed-use collaborative facility such as the Gloucester Marine Innovation Center. Due to Gloucester's proximity to New England's historic fishing grounds and the Greater Boston technology and academic market,

the design team believes that Gloucester will be a more attractive and financially viable location for a marine innovation center than Portland.

On the operating expense side, GMRI's square foot expenses were used as a proven comparable for a similar mixed-use facility. Mid-range assumptions were used for the social impact mortgage debt. Social impact loan rates range from 2%-5%, depending on the investor and the nature of the investment; a mid-range rate of 3.5% was used as a compromise between the strength of the collateral backing the loan and the likelihood that interest rates will rise gradually through 2017. Two different loan structures were modeled, one with straight-line amortization (20-year term on the premise that social impact debt is inherently patient capital) and the second with interest only (10-year balloon, again on the premise of patient capital).

A sample iteration of the design team's pro forma operating statement is provided at right. There are an enormous number of variables to consider – proportion of ocean engineering, adaptive fisheries management, new product development, and public outreach uses; capital investment required to support the resulting mix; project financing mix; debt terms; operating expenses; start-up lease terms, etc. In the course of assessing various financing and tenant scenarios, the design team concluded that the facility would be financially viable so long as it does not assume debt in excess of 20% to 25% of project finance costs.

This is a very different financing model than typically used for commercial real estate. It is necessitated by the initial capital cost of fulfilling a unique marine innovation mission. GMRI has proven that this model can work financially, and, more importantly, provide a working waterfront with a focal point for ocean innovation that will define the 21st century working waterfront.

Proforma Operating Statement

REVENUE		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Total Revenue								
Ocean Engineering	$ 32,019	$ 1,002,040	$ 1,002,040	$ 1,002,040	$ 1,032,101	$ 1,063,064	$ 1,094,956	$ 1,127,805
Adaptive Fisheries Research	14,105	419,427	419,427	419,427	432,010	444,970	458,320	472,069
Ocean Product Development	5,854	187,342	187,342	187,342	192,963	198,751	204,714	210,855
Public Education & Outreach	2,257	62,628	62,628	62,628	64,507	66,442	68,436	70,489
	$ 54,236	**$ 1,671,438**	**$ 1,671,438**	**$ 1,671,438**	**$ 1,721,581**	**$ 1,773,228**	**$ 1,826,425**	**$ 1,881,218**

EXPENSES	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Common Area Charges							
Building & Space Cleaning	$ 37,965	$ 38,724	$ 39,499	$ 40,289	$ 41,094	$ 41,916	$ 42,755
Maintenance - grounds/snowplowing	40,677	41,490	42,320	43,166	44,030	44,910	45,809
Trash	4,339	4,426	4,514	4,604	4,697	4,790	4,886
Supplies (cleaning, light bulbs, etc)	22,779	23,235	23,699	24,173	24,657	25,150	25,653
Maintenance - building	59,659	60,852	62,069	63,311	64,577	65,869	67,186
Electricity for A/C	118,776	121,151	123,575	126,046	128,567	131,138	133,761
Water & sewer	13,559	13,830	14,107	14,389	14,677	14,970	15,270
Heating - Gas	39,592	40,384	41,192	42,015	42,856	43,713	44,587
IT Systems Maintenance	24,406	24,894	25,392	25,900	26,418	26,946	27,485
Telephone/Internet	72,133	73,576	75,048	76,548	78,079	79,641	81,234
Window Cleaning	11,389	11,617	11,850	12,087	12,328	12,575	12,826
Management fee	54,236	55,320	56,427	57,555	58,706	59,880	61,078
Property Insurance	29,287	29,873	30,470	31,080	31,701	32,335	32,982
Subtotal Common Area Charges	**$ 528,797**	**$ 539,373**	**$ 550,161**	**$ 561,164**	**$ 572,387**	**$ 583,835**	**$ 595,511**
Non Recoverable Charges							
Building Replacement Reserve	$ 542,356	$ 542,356	$ 542,356	$ 542,356	$ 542,356	$ 542,356	$ 542,356
G&A	84,608	84,608	84,608	84,608	84,608	84,608	84,608
Vacancy Reserve	83,572	83,572	83,572	86,079	88,661	91,321	94,061
Subtotal Non Recoverable Charges	**$ 710,535**	**$ 710,535**	**$ 710,535**	**$ 713,043**	**$ 715,625**	**$ 718,285**	**$ 721,024**
Total Expenses	**$ 1,239,333**	**$ 1,249,908**	**$ 1,260,696**	**$ 1,274,206**	**$ 1,288,012**	**$ 1,302,120**	**$ 1,316,536**
Net Operating Income	**$ 432,105**	**$ 421,529**	**$ 410,742**	**$447,375**	**$ 485,217**	**$524,306**	**$564,682**
% of Revenue	25.9%	25.2%	24.6%	26.0%	27.4%	28.7%	30.0%

Straight Line Amortization	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Principal	$ 210,933	$ 218,436	$ 226,205	$ 234,250	$ 242,582	$ 251,210	$ 260,144
Cumulative	210,933	429,369	655,574	889,824	1,132,406	1,383,615	1,643,759
Interest	206,638	199,135	191,366	183,321	174,989	166,361	157,427
Cumulative	206,638	405,773	597,139	780,460	955,449	1,121,811	1,279,238
Total Debt Service	417,571	417,571	417,571	417,571	417,571	417,571	417,571
Cumulative	417,571	835,142	1,252,713	1,670,284	2,087,855	2,505,426	2,922,997
Coverage Ratio	**1.03**	**1.01**	**0.98**	**1.07**	**1.16**	**1.26**	**1.35**

Interest-Only with Balloon	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Principal	-	-	-	-	-	-	-
Cumulative	-	-	-	-	-	-	-
Interest	$ 210,000	$ 210,000	$ 210,000	$ 210,000	$ 210,000	$ 210,000	$ 210,000
Cumulative	210,000	420,000	630,000	840,000	1,050,000	1,260,000	1,470,000
Total Debt Service	210,000	210,000	210,000	210,000	210,000	210,000	210,000
Cumulative	210,000	420,000	630,000	840,000	1,050,000	1,260,000	1,470,000
Coverage Ratio	**2.06**	**2.01**	**1.96**	**2.13**	**2.31**	**2.50**	**2.69**

Recommended Next Steps

As noted above, the zoning limitations, subsurface risks, and capital cost of building on waterfront sediment at I4C2 preclude organic development of a facility like the proposed Gloucester Marine Innovation Center by the commercial real estate market. Nonetheless, development of such a facility can be advanced through a series of pre-RFP actions by the City of Gloucester to increase the building capacity of the site, reduce development risk, and make I4C2 more attractive as a development opportunity. With the benefit of these actions, an RFP designed to attract a hybrid development team is likely to attract an interesting mix of innovative development proposals.

Specifically, the design team recommends that the City take the following steps to facilitate the development of the Gloucester Marine Innovation Center:

1. Amend Gloucester's zoning ordinance as required to allow at least a 50 ft. building height, or allow a height exception for the site.

2. Amend Gloucester's parking requirements for the site or for the zone to allow for greater development.

3. Fund internally or seek state economic development or U.S. Economic Development Administration funding to complete the following tasks to reduce development risk, signal City commitment to the strategic development of I4C2, and set the stage for a RFP that will attract a significant number of proposals:

    a. Retain a marine engineering firm to assess current and future wharf uses and develop a conceptual design for a wharf that will adequately serve those uses; and,

    b. Retain a marine engineering firm to assess the integrity of the bulkhead on the site to identify any maintenance or structural needs that may be warranted in the course of improving the site.

    c. Complete a geotechnical investigation to characterize sediment depths and reduce subsurface risks;

    d. Complete a Phase 1 Environmental Site Assessment to review historical uses on and around the site to identify potential subsurface contamination concerns and hopefully reduce developer concern about environmental risks on the site; and,

    e. Complete a revised topographic and ALTA boundary survey to fully characterize the property and provide potential developers with comfort about the property.

While the City could proceed with an RFP without taking any of these steps, any or all of these steps would dramatically enhance the marketability of the site and likelihood of success of developing the Gloucester Marine Innovation Center.

4. Identify and support a champion/manager to focus on funding and completing steps 1-3 above. Options include a designated and appropriately qualified member of City staff or retaining an outside development management firm or independent individual project manager working under the supervision of City staff. This is a complicated project with enormous potential to position Gloucester as a center for marine innovation. As such, it requires and deserves focused, capable leadership to advance to a successful RFP.

5. Structure an RFP to inspire and reward proposals from partnerships between private developers and non-profit or academic institutions, as well as traditional private developers, to shape and steward the marine innovation mission of the facility developed. In the long-term economic cycle, involvement of a non-profit, mission-oriented partner is essential to sustaining the will, creativity, and access to diverse sources of funding to preserve the marine innovation vision of the facility.

This recommended course of action would represent an extraordinary act of vision, leadership, and commitment by the City of Gloucester. It would insure that I4C2 evolves as a focal point for the future of Gloucester's working waterfront as a hub of marine innovation. Word will get out about Gloucester's commitment to a 21st Century waterfront that supports a blend of adaptive fishing enterprises, marine engineering entrepreneurs, and innovative marine product businesses. Such commitment will create gravity and attract a unique mix of tenants who will contribute to the evolution of a robust and resilient 21st Century working waterfront in Gloucester.